

Loss Simulator

2010 Casualty Loss Reserve Seminar

Presenter: You, Hai,

VP Technology

<http://www.gouon.com>





If you cannot explain it simply, you don't understand it well enough

--Albert Einstein

What do we try to simulate?

- Occurrences
- Claims
- Transactions (such as case reserve, payments, adjustments, etc)

All about raw claims



Start Simulation

Summary Claims Loss Triangles

| Occurrence No. | Date | Claim No. | Accident Date | Report Date | State | Line | Type |
|----------------|---------|-----------|---------------|-------------|-------|--------|--------|
| Occurrence 2 | 3-2000 | 1 | 6/16/2000 | 6/26/2000 | 0 | Line 1 | Type 1 |
| Occurrence 3 | 3-2000 | | | | | | |
| Occurrence 4 | 4-2000 | | | | | | |
| Occurrence 5 | 5-2000 | | | | | | |
| Occurrence 6 | 6-2000 | | | | | | |
| Occurrence 7 | 6-2000 | | | | | | |
| Occurrence 8 | 8-2000 | | | | | | |
| Occurrence 9 | 9-2000 | | | | | | |
| Occurrence 10 | 10-2000 | | | | | | |

1

| Transaction Date | Description | Case Reserve | Payment |
|------------------|-------------|--------------|---------|
| 6/26/2000 | REP | 2000 | 0 |
| 8/31/2000 | RES | 117721 | 0 |
| 9/8/2000 | RES | 3114 | 0 |
| 12/7/2000 | RES | -20821 | 0 |
| 1/12/2001 | CLS | -102014 | 136997 |

Number of Iterations: 1

Run Stop Close

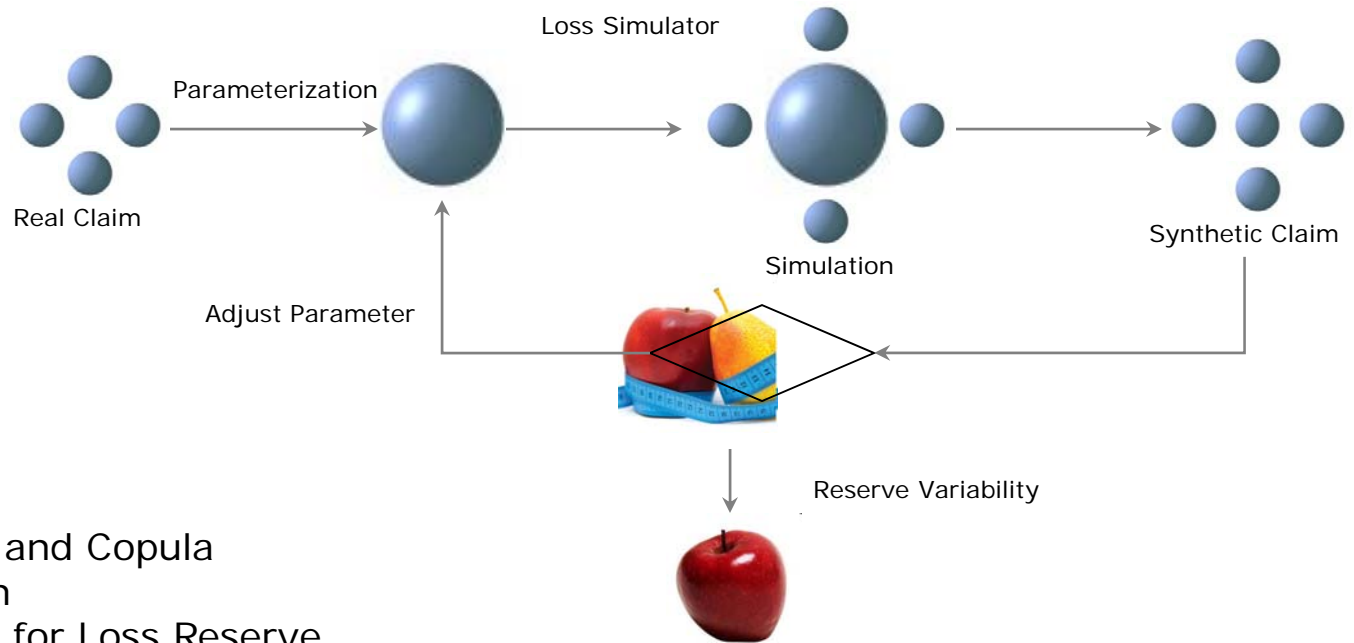
Where is the passion (value)?

This system will underlie the loss triangles and other statistics used to estimate loss reserves

- A platform that can generate synthetic claims
- The generated claims will have the same statistical characteristic as the company real claim data, in regarding to lags, payments, frequency, case reserves, adjustment, etc, etc.
- The generated claims could be summarized into loss development triangles and complete rectangles, which could then be used to test loss reserving methods and models.
- Aid people in better understanding the underlying loss development process.



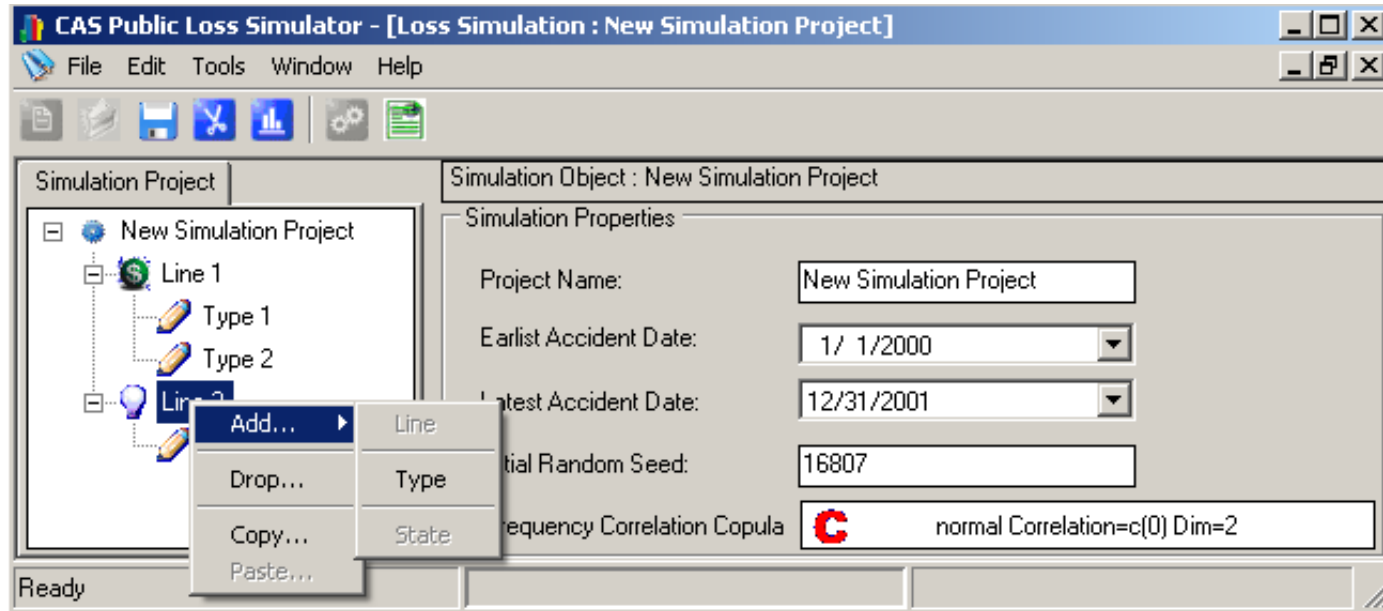
Vision and Enhancement



- Copula, Copula, and Copula
- Parameterization
- Predictive Model for Loss Reserve
- Challenges
 1. Real claim process is very complicated
 2. Modeling variance
 3. Parameter variance
 4. Process variance
 5. Unquantifiable variance

Example

Simulation Project Parameters Setup.



- Windows Standard UI
- Tree Structure
- Accident Year Range
- Random Seed
- Line Level Frequency Correlations from Copula



Example continue

Line Level Parameters Setup.



The screenshot shows the 'CAS Public Loss Simulator' window with the following parameters for 'Line 1':

| Parameter | Value |
|------------------|-------------------|
| Description | Line 1 |
| Annual Frequency | Poisson lambda=12 |
| Monthly Exposure | (1) |
| Trend | (1) |
| Seasonality | (1) |
| Claim/Acc | (1,3,1) (2,1) |

- Annual Frequency
- Exposure, Trend, and Seasonality
- Multinomial Claim Distribution

Example continue

Coverage Level Parameters Setup.



Type Object : Type 1

General | **Lags** | Amounts

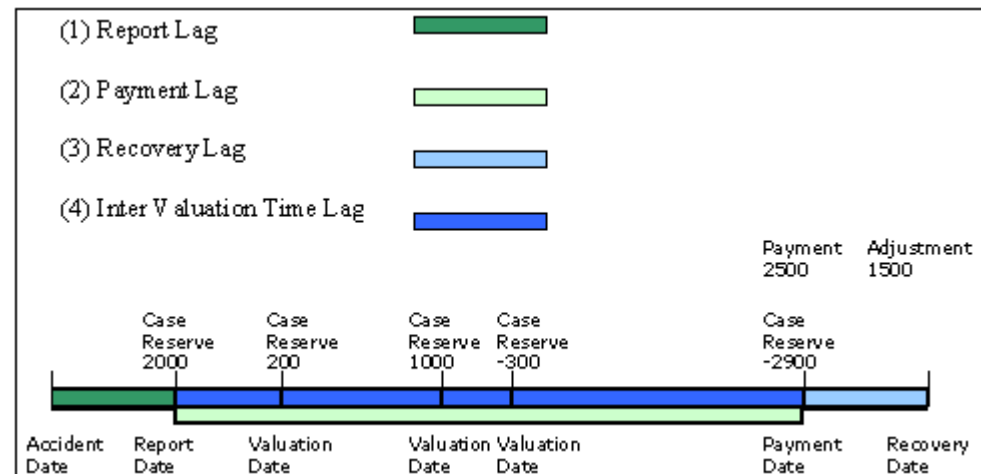
Report Lag (Exponential (rate=0.0109589))

Payment Lag (Exponential (rate=0.002739726))

Inter-Valuation Waiting Times (Exponential (rate=0.0109589))

Recovery Lag (Lognormal meanloq=3 sdloq=1)

Lags



Example continue



Coverage Level Parameters Setup.

Type Object : Type 1

General | Lags | **Amounts**

Size of Entire Loss

Correlation with Payment Lag normal Correlation=c(0) Dim=2

Trend Alpha

Deductible P(0)

Case Reserve Adequacy

40% Case Reserve Adequacy

70% Case Reserve Adequacy

90% Case Reserve Adequacy

Est P(0) Threshold

Minimum Change Min Rel Change

Inertia Fast Track

Initial Payment Adequacy

P(1)

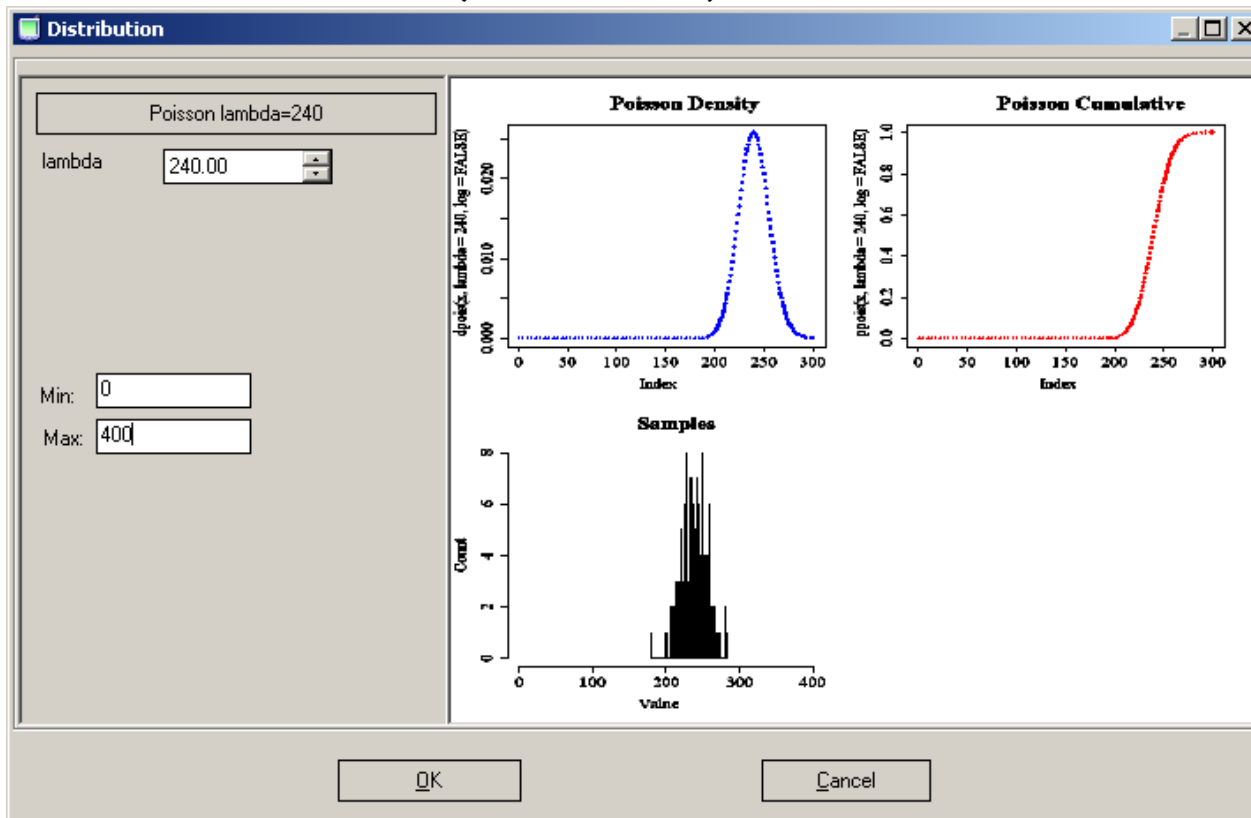
Severity Properties

Case Reserve Interpolations

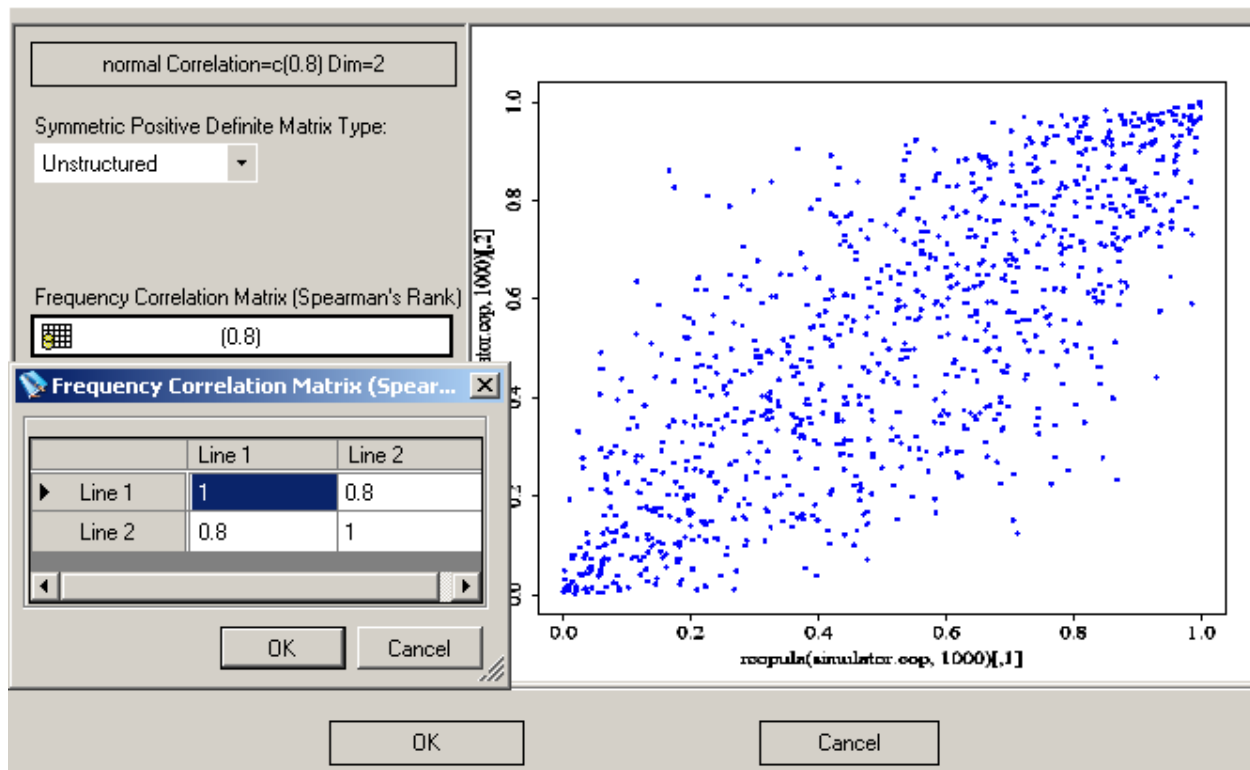
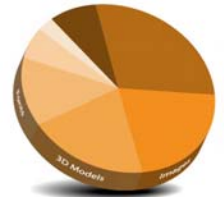
Recovery Properties

Example continue -- Distribution

A Poisson Distribution (lambda=240)



Example continue -- Copula



A Normal Copula

Frequencies among lines.

Payment lag and size of claim.

Complicated Fact of Statistics

The weather forecast:
It has 35% chance to rain tomorrow.

My question is: should I bring my umbrella or not?

